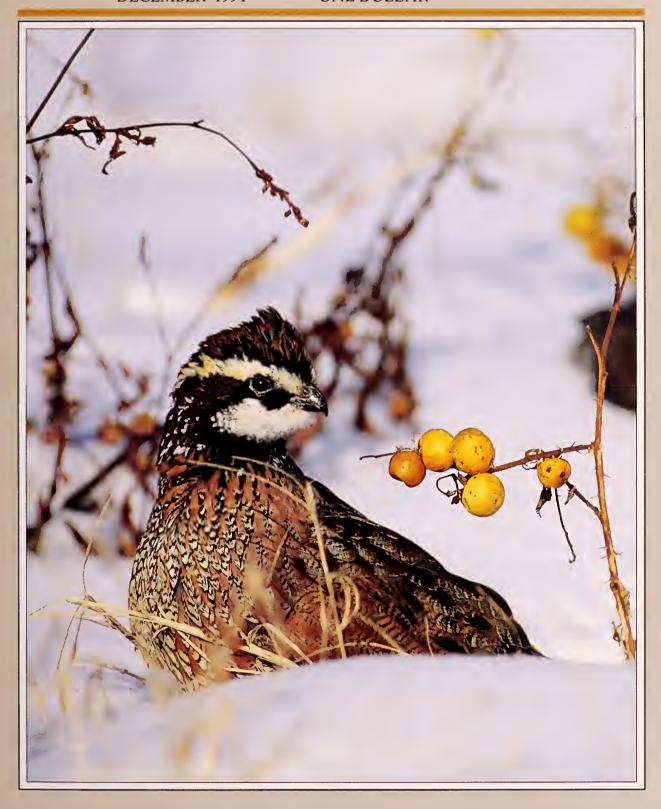
## VIRGINIA WILDLIFE

DECEMBER 1994

ONE DOLLAR





Is it a world-class trophy? You can size up your rack in the field if you learn a few tricks of the trade. See page 14 for details; photo by Bill Lea.

## VIRGINIA WILDLIFE



Cover: Are bobwhites and lespedeza inseparable? Sift through the evidence surrounding the relationship of bobwhite numbers to lespedeza abundance in Virginia—starting on page 18; photo by Lynda Richardson. Back cover: photo by Bill Lea.

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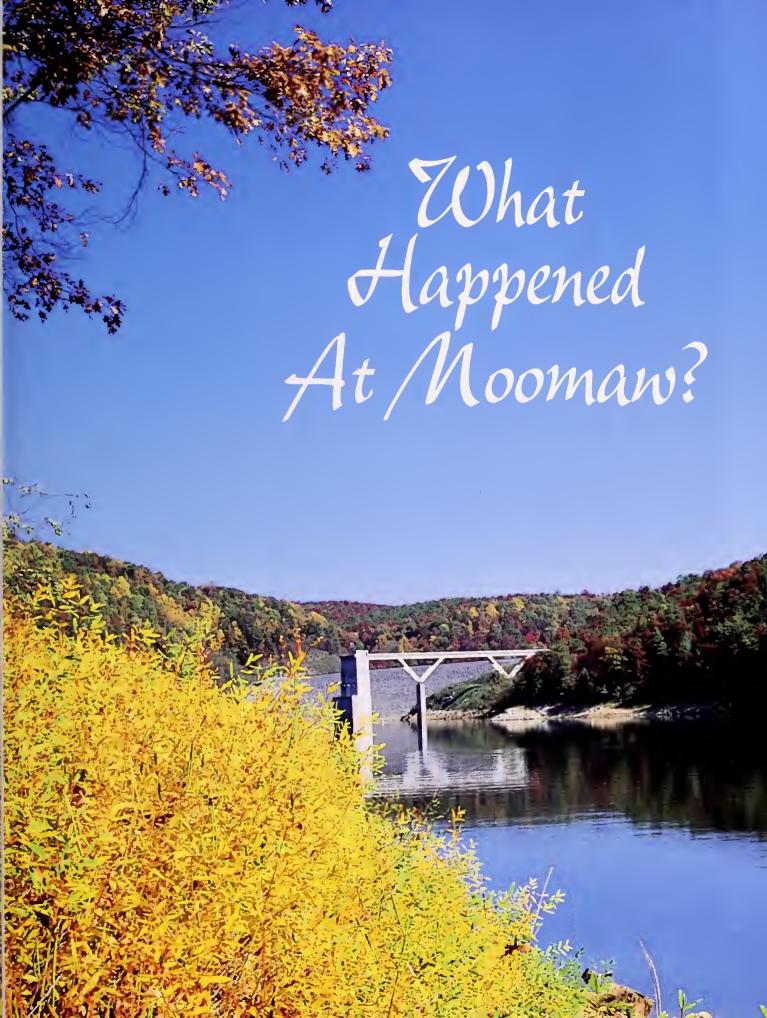
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Dedicated to the Conservation of Virginia's Wildlife and Natural Resources





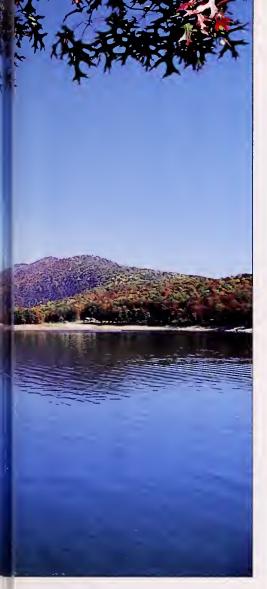
by Tom Hampton

hen the swirling waters of the Jackson River met Gathright Dam in 1981, a reservoir was born. The 2,530-acre Lake Moomaw was a novel attraction in an area well known for its majestic mountains and cascading streams. When fisheries biologists with the Virginia Department of Game and Inland Fisheries (VDGIF) viewed the 12-mile long Lake Moomaw with its more than 43 miles of shoreline, they recognized the beauty of potential. Except for the resident fish from the flooded Jackson River, the waters were a clean slate for stocking.

In the mid-1980's, Lake
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A few years later, the
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What happened?
Fisheries biologists
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but they had to prove it.

But, as the story of the developing trophy trout fishery at this lake proves, fisheries management is never as easy as dropping a few fish into the water, setting creel regulations, and walking away—especially when things start to change underwater.

Initially, biologists realized that Lake Moomaw's mountainous location might allow trout to survive year-round, and decided to stock brown, rainbow, and brook trout. However, though warmwater species such as largemouth bass and bluegill sunfish could be established with a single stocking, a reservoir trout fishery would not develop as easily. Three components were essential to the success of the fishery. First, trout would have to be stocked each year to maintain a population. Second, the trout would need cold (55 to 70°F) and well-oxygenated water throughout the year. Finally, the trout would require an abundant source of food. Small prey fish usually provide the best food base for trout in reservoirs.



year. Furthermore, because much of the surrounding watershed is forested, the reservoir is only moderately fertile, and dissolved oxygen stored in the deep water is not depleted during the summer. (In reservoirs that flood more fertile soil, or that receive excessive agricultural runoff, decomposing organic matter rapidly depletes the available oxygen from the deeper waters.) Thus, Lake Moomaw contains suitable trout habitat even in the summer. When the surface temperatures are too warm, trout can move to deeper water and continue to feed and grow.







Lake Moomaw (left) has all the ingredients for a trophy trout fishery, as evidenced by the 5-year-old, 10 lb. plus brown trout taken from the lake by the author (top). But, when the fishery crashed in the late 1980's, biologists inserted transmitters in trout in a first-of-its-kind study (middle). They traced the problem to a cold-water release (above) from the dam, which was intended to support a trout fishery in the Jackson River, but instead robbed Lake Moomaw of its ideal trout habitat.

Tackling the first consideration, it was decided that the Lake Moomaw trout fishery would be stocked on a put-grow-and-take basis. Put-grow-and-take means that the trout are small when stocked (put), and must grow in the reservoir before they are large enough to legally creel (take). About 25,000 brown trout and 25,000 rainbow trout are now stocked each year. Brook trout are occasionally stocked when Department-owned hatcheries produce a surplus.

The second consideration took care of itself. For, unlike most Virginia reservoirs, Lake Moomaw contains cold and well-oxygenated water all year. With an average depth of 46 feet and a maximum of 150 feet, Lake Moomaw can store winter-cooled water throughout the

When biologists were convinced that trout could survive year-round in the lake, alewives were added to provide an abundant forage base for the trout. Members of the shad family, these small fish cruise in schools in the open water areas of the reservoir, feeding on tiny organisms called plankton. Reservoir trout inhabiting these same areas are offered almost constant access to the alewives, and studies have shown that brown trout feed almost exclusively on them. In addition to alewives, rainbow trout frequently consume aquatic and terrestrial in-

The combination of ideal habitat and abundant food proved to be an outstanding recipe for growing trout at Moomaw. Brown and rainbow trout stocked at six to eight inches doubled their length in the first year. In fact, trout grew almost one inch per month during their initial months in the reservoir!

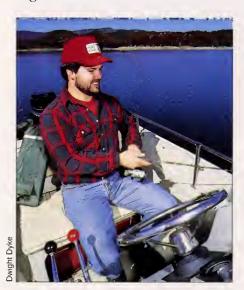
Growth in weight was also exceptional. A trout that weighed less than two ounces when stocked would reach the one-pound mark before its first winter. Brown and rainbow trout grew to trophy proportions after about two years, measuring 18 to 22 inches and weighing three to five pounds. After only three years in the reservoir, trout measured 24 to 27 inches long, and weighed as much as eight pounds. Trout that survived to grow four years or more attained sizes usually found only in daydreams and tall tales. Current lake records include a 12-pound, 10-ounce rainbow trout, an 11-pound, 15-ounce brown trout, and a 5-pound, 10-ounce brook

With all the necessary factors in place, the Lake Moomaw trout fishery was off to a promising start in the 1980's. The allure of trophy trout in an uncrowded setting enticed anglers from great distances. Trophy brown and rainbow trout were reported by the hundreds. The Virginia Trophy Fish Citation program was flooded with applications. In fact, because of the enormous numbers of trophy trout landed at Lake Moomaw, biologists raised the

state's minimum citation size to four pounds for rainbow trout, and five pounds for brown trout. Biologists and anglers expected to hear the news of a new state record trout at any time—then the fishery crashed.

In 1989, angler success plummeted. Fish population sampling revealed that the trout stocked into the reservoir in 1987 and 1988 had extremely poor survival rates. Because habitat and food were abundant during both years, the poor survival seemed to be the result of stocking methods. So, stocking dates were changed from early fall to winter to allow the small trout to get adjusted to their new environment at a time when colder temperatures slow the activity of potential predators. The first winter stocking took place in 1989

Still, the summer of 1990 brought more changes. Gathright Dam began releasing 58°F cold water during the summer months. Part of an



original mitigation agreement between VDGIF and the U.S. Army Corps of Engineers, the cold water released from Gathright Dam would allow a trout fishery to be developed in the Jackson River downstream, to partially replace the 12 miles of trout stream flooded by the reservoir in 1981. Everyone involved expected the cold-water release, but no one anticipated its effects on the Lake Moomaw trout fishery.

#### Figure A

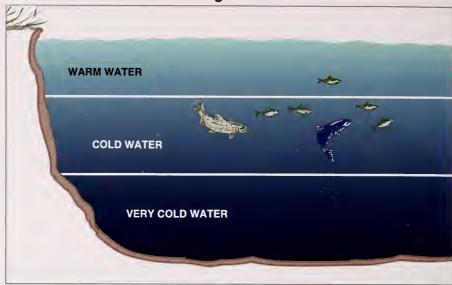
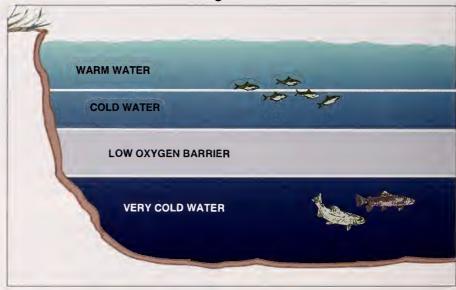


Figure A illustrates fish distribution in Lake Moomaw under ideal conditions. Note that trout and the alewives they prey upon occupy the same cold-water habitat in this illustration. Figure B illustrates what happened in Lake Moomaw when oygen-rich cold water was released during the summer months. Alewives were able to survive in warmer water, but the trout were forced to retreat to very cold water, thus isolating them from their food source for up to 45 days. Illustrations by Pels.

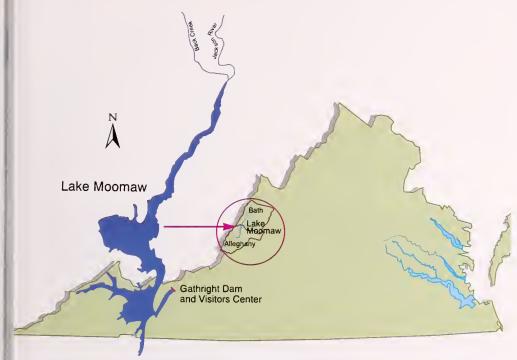
#### Figure B



The original plan was to utilize the multi-million dollar release structure to mix warm water with cold water to get the desired release temperature. However, the release procedure chosen in 1990 consisted of drawing water directly from the depth where water temperature was closest to 58°F. Because this method would draw directly from ideal trout habitat in the reservoir, biologists were concerned that the best trout habitat in the lake might be lost

and the trout fishery would suffer.

As cold water poured through Gathright Dam and into the Jackson River, biologists watched for changes in the reservoir. Water quality data taken in 1990 confirmed their suspicions—trout habitat in Lake Moomaw was drastically reduced under the new operation. In the summer of 1991, a research project began to describe the changes in reservoir habitat and to determine the response of the trout population.



Lake Moomaw is a terrific spot for trophy trout fishing and family recreation. Located in Bath and Alleghany Counties, it can be reached by taking I-64W to Route 220N in Covington. Turn onto Route 687 and follow the signs to the lake. For more information about the facilities at the lake, contact the GWNF James River Ranger District at 703/962-2214 or the Warm Springs Ranger District at 703/839-2521. Map by Pels.



The research was a cooperative effort of VDGIF, Virginia Tech, and the U.S. Forest Service. From July of 1991 to October of 1992, temperature and dissolved oxygen concentrations at 3 feet increments from the surface to the bottom were taken at 10 locations in the reservoir. Using gillnets, biologists determined the depth distributions of both the trout and the alewives and gained information about the diet, physical condition, and growth of trout in the lake.

The information collected in 1991 was not encouraging. The amount of trout habitat in the reservoir declined steadily during the months of July and August. In early September, for the first time since the reservoir was filled, there was no suitable trout habitat in Lake Moomaw. Gillnet sampling indicated that the trout were surviving, but had altered their depth distributions.

What was happening? Well, small, young trout remained in relatively shallow water. The tempera-

tures were warm for trout, but young fish are typically more tolerant. Alewives were distributed from the surface to about 40 feet. Small trout captured at these depths had been feeding on the alewives. The older and larger trout however, had moved to water deeper than 60 feet. At these depths the temperature was very cold (42°F). One adult brown trout was captured at 82 feet. None of the large trout captured in the gillnets had any food in their stomachs. No alewives were collected at depths greater than 50 feet in the gillnets.

Dissolved oxygen profiles indicated that the larger trout were isolated from their prey by about 20 feet of water that contained little or no dissolved oxygen. This oxygen barrier remained until mid-October. Gillnets fished in mid-October captured large trout at depths of 60 to 70 feet. This suggested that the large trout had been isolated from their food source for about 45 days.

Habitat conditions were similar in the late summer and early fall of 1992. Once again, gillnet data suggested that the trout were isolated from their prey, but another sampling method was needed to gather more information about the large trout.

During the 1992 sampling season, researchers were able to track the movement of individual trout using ultrasonic telemetry. Transmitters about the size of lipstick tubes were surgically implanted into large brown and rainbow trout captured in the reservoir and its tributaries. Each transmitter released a different sequence of beeps. These beeps not only revealed an individual fish's location, but also relayed the water temperature at that particular location. By comparing this temperature to a surface to bottom profile of temperature, the approximate depth of a tagged fish's location could be determined. The telemetry equipment allowed biologists to determine that these large trout were indeed isolated from their food source beginning in late summer. The tagged trout remained in an extremely cold layer of deep water until mid-October.

The next few months were spent analyzing data, arranging meetings, and preparing a convincing presentation in favor of changing the dam operation. VDGIF previously had approached the Corps of Engineers, requesting the mixing of warm and cold water to achieve the target temperature downstream. To modify the existing procedure, however, the Corps of Engineers required two

mine if the new release procedure could benefit the trout population. At the end of the two-year period, the three agencies would meet again to discuss the advantages and disadvantages of the new release procedure. The better of the two release methods would be chosen as the future operating procedure.

Temperature and dissolved oxygen profiles taken in late summer

release operation will be used in the future. VDGIF will use data describing the increased habitat and improved fish condition to support a request to continue the mixed release indefinitely.

Biologists are turning their efforts now toward increasing the number of large trout in Lake Moomaw. New size and creel limit regulations have been adopted this fall for the



things: 1) data that indicated a change was necessary, and 2) a cooperative agreement among all agencies involved.

The results of the research were presented to the Virginia Department of Environmental Quality (DEQ) and the Corps of Engineers. DEQ shared concerns about the cold-water release procedure, and supported VDGIF with a letter to the Corps of Engineers. A cooperative agreement was reached in late spring of 1993.

Under the terms of the agreement, the Corps of Engineers agreed to mix warm and cold water before releasing it downstream of Gathright Dam for a period of two years. The Corps of Engineers would monitor water quality in the reservoir, while DEQ monitored the water quality of the Jackson River below the dam. VDGIF would evaluate the effects of the new release on trout habitat in Lake Moomaw, and deter-

and early fall of 1993 suggested that the new release method preserved trout habitat in Lake Moomaw. For the first time since 1990, trout habitat did not completely disappear during the month of September.

Sampling conducted at the reservoir in 1994 also provided evidence that the new release benefited the trout population. Trout habitat remained in the reservoir for a second full season. Sampling conducted in September 1994 revealed that trout and alewives were once again occupying the same locations in the reservoir. Adult trout captured in gill nets were in excellent condition, having taken advantage of the abundance of habitat and food.

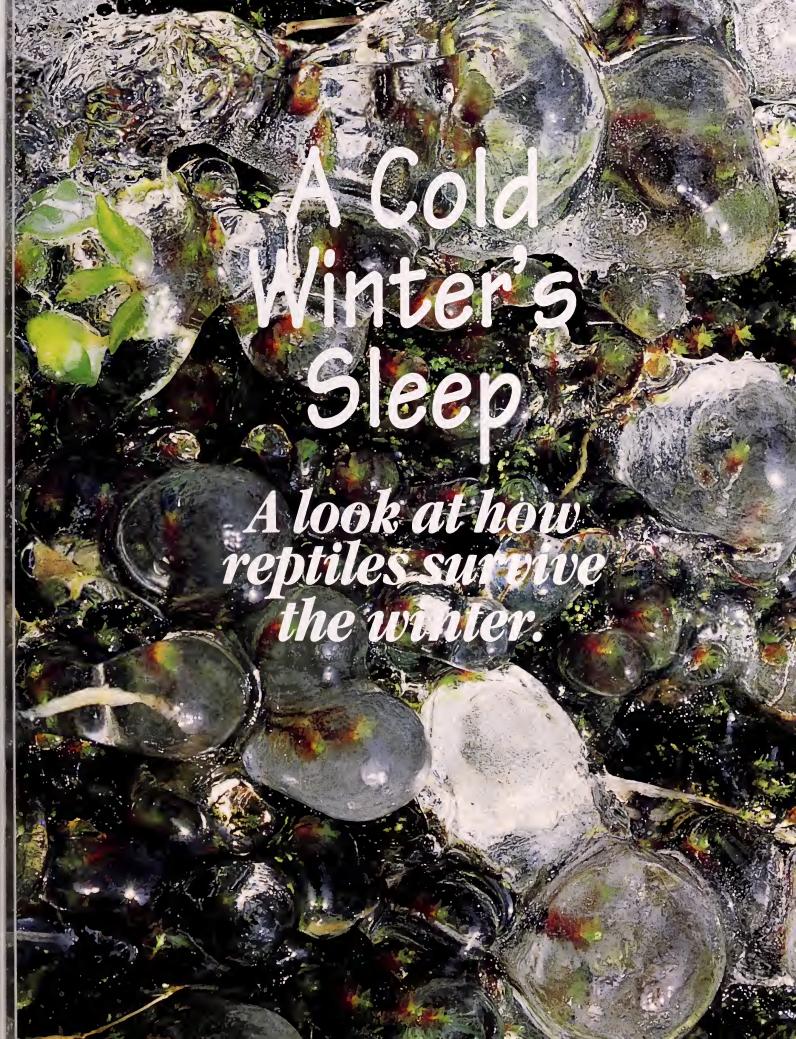
As the two-year experimental operation period draws to a close, all indications are that the mixed release has substantial benefits for the trout population. The three cooperating agencies will meet again in the spring of 1995 to determine which

trout fishery. Anglers will be allowed to creel two trout per day larger than 16 inches. This will mean that trout stocked in December can enjoy a full year of growth before reaching legal harvest size.

Thirteen years have passed since trout management began at Lake Moomaw. Although a changing reservoir has challenged the trout population, the fishery has survived its childhood. Biologists continue to keep a watchful eye on the vital signs of the fishery: the trout population, reservoir habitat, and angler success. Changing situations demand new strategies for managing the resource.

The beauty of potential still exists at Lake Moomaw. We believe the best is yet to come.  $\square$ 

VDGIF fisheries biologist Tom Hampton was the project leader for the Lake Moomaw trout study.









Although the critically endangered chicken turtle (left, middle) spends its summers in freshwater ponds, it overwinters several inches below the surface in sand dunes. The eastern box turtle (above) buries into the soil under leaf litter when the weather gets cold; whereas stinkpots (left, bottom) often spend the winter buried in the bottom mud underwater. They can obtain oxygen from water across their mucous membranes

and skin. Timber rattlesnakes (left, top) hibernate in groups below the frost line in rocky areas and ledges with deep cracks and crevices.

#### by Joseph C. Mitchell

inters in many places in Virginia can be pretty cold. So why don't snakes, lizards, and turtles freeze to death in winter when outside temperatures fall well below freezing?

It's common knowledge that reptiles cannot maintain their internal body temperatures at a constant level. They are dependent on external sources of heat to keep them alive. They bask in the sun or may heat up on sun-warmed rocks or logs. Consequently, they regulate their temperature by moving back and forth between warm and relatively cooler locations.

So what happens when it gets really cold? The obvious answer is that reptiles go underground below the frost line and just hibernate. That would, however, only be a partial answer. The rest of the story involves rocks, trees, leaf litter in the forest, the use of free water, antifreeze, and the ability to tolerate freezing.

Reptiles do hibernate. Perhaps the most well-known hibernation sites of all reptiles in this part of North America are the dens of timber rattlesnakes (Crotalus horridus). In the Virginia mountains, these snakes overwinter below the frost line in rocky areas and ledges that have deep cracks and crevices. Snakes use these sites as population

centers. There, they congregate in the fall and enter what we call subterranean hibernacula when temperatures drop below 52°F. The snakes emerge at similar temperatures in spring. Inside the den, timber rattlesnakes move along a thermal gradient, going deeper as the entrance temperature decreases and moving toward the entrance as its temperature increases.

When they are not holed up for the winter, timber rattlesnakes disperse as far as 1.7 miles from their dens to search for mates and mammalian prey, and to set up summer home ranges. It is a relatively simple strategy to return to the same place that one's ancestors learned was a safe place to spend the winter, at



least until humans came along.

Other snakes spend winters underground in burrows of their own making or those made by rodents, or they may use decaying root tunnels.

For instance, mud snakes (Farancia abacura), large snakes found in wetlands in southeastern Virginia, are active from about April through October, but hibernate on land in the cold months. They leave the wetlands in late fall and burrow into rotting pine stumps or into the sand. Hatchlings also overwinter on land in their nest cavities, entering wetland habitats the following spring. Other snakes, like black rat snakes (Elaphe obsoleta) and eastern garter snakes (Thannophis sirtalis) overwinter in rock crevices, under rocks deep in soil, and in abandoned wells and house foundations.

Virginia biologist Kurt Buhlmann determined that some of our critical-

ly endangered chicken turtles (Deirochelys reticularia), overwinter several inches below the surface on sand dunes. We do not know if all of the turtles in this population spend winters on land, but at least some of them do. Knowing that snakes and turtles utilize the terrestrial habitat around wetlands is important for conservation and management. If populations of these animals are to remain healthy, then adequate buffer zones need to be included around all protected wetlands.

Other reptiles known to overwinter buried in the soil include sixlined racerunners (Cnemidophorus sexlineatus) and eastern box turtles (Terrapene carolina). Six-lined racerunners dig their own tunnels on exposed roadcut banks or in sand under vegetation. They just hollow out a chamber at the end and plug the entrance. Box turtles, a widespread, terrestrial species in Virginia's hardwood forests, simply burrow into the soil under leaf litter when the weather gets cold. Hibernation begins near the surface but the turtle works its way deeper as the weather get colder, reaching a depth of several inches during the coldest periods. However, they are sometimes found with the backs of their shells exposed to the winter elements.

Leaf litter makes great insulation, sort of like down feathers in a jacket. Ground skinks (*Scincella lateralis*) live in the leaf litter of hardwood forests year-round and overwinter beneath it. Because of their small body size, they quickly gain heat on warm, sunny days in winter as the leaves heat up. I have found them active in the middle of winter as they bask on and under the warm leaves.

Temperatures inside a mound of leaves, grasses, and other organic matter can also be warmer than the surrounding cold air. This is because the decomposition process creates heat. Box turtles often take advantage of this phenomenon and spend winters buried inside piles of leaves.

Hollow trees, logs, and stumps, in addition to rock piles and old buildings, are favored places for hibernation by adult black rat snakes. These large snakes are widespread in the Commonwealth from sea level to high mountains, and are known to spend winter months in the same hibernaculum year after year, sometimes in the same dens with timber rattlesnakes. Although they are protected from the harsh winter elements by the trunk of a hollow tree or log, one has to wonder why they don't freeze inside





Black rat snakes (left) and eastern garter snakes (right) overwinter in rock crevices, under rocks deep in soil, and in abandoned wells and house foundations.

during bitter winter periods. We do know, however, that these snakes can tolerate near zero temperatures for short periods of time.

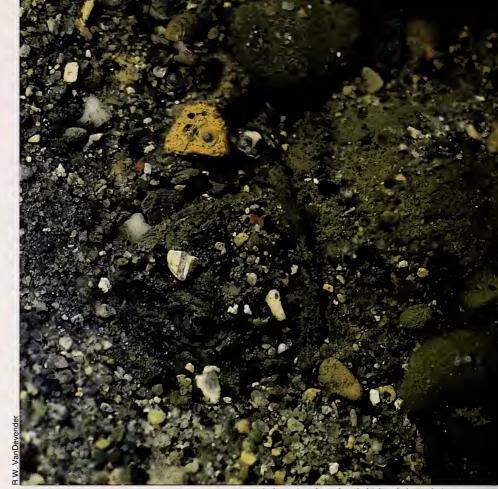
Many species in the temperate zone are able to survive short periods of supercooling, with body temperatures reaching 30.2-28.4°F. Recent research on freeze tolerance has shown that some species of reptiles can also survive the formation of ice crystals in the spaces between the cells. The freezing of water inside most animals causes physical damage to cells and tissues and disrupts the balance of important chemicals, causing dehydration and possibly death.

Three species of reptiles that occur in Virginia are known to tolerate freezing. Box turtles from the upper Midwest have been shown by Jon Costanzo and Dennis Claussen of Miami University in Ohio to tolerate body temperatures as low as -25.5°F and survive complete freezing of 7-58% of their total body water for at least three days. This survival mechanism allows box turtles to overwinter buried in shallow soil. It also explains why these turtles can survive with the tops of their shells exposed.

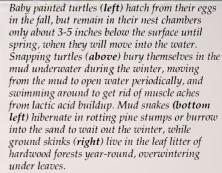
Painted turtles (Chrysemys picta) hatch from their eggs in the nest in fall. But instead of emerging from the nest, most of these baby turtles remain there over winter and emerge the following spring to enter aquatic habitats. Nest chambers are only about 3-5 inches below the surface and, in northern latitudes and probably some places in Virginia, experience subzero temperatures.

Kenneth Storey and associates of Carleton University in Canada determined that hatchling painted turtles survived 24 hours of freezing at -24.8°F with 52-53% of their total body water as ice. Hatchling painted turtles in most Virginia populations probably cannot tolerate such cold temperatures. However, because freeze tolerance in reptiles tends to match local winter temperatures, some northern Virginia populations may be able to withstand some limited freezing.

In contrast to painted turtles,



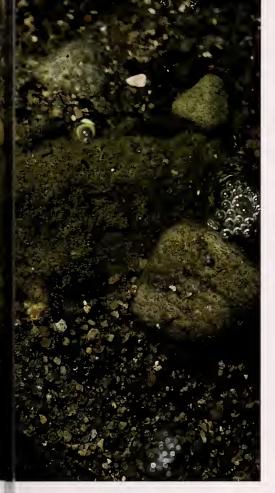






hatchling snapping turtles (*Chelydra serpentina*) are unable to withstand freezing. This fits well with their pattern of nest emergence. Baby snapping turtles hatch in late summer and fall and emerge from the nest at that time. They are not known to overwinter in the nest.

Costanzo and his associates also determined that garter snakes were able to survive some limited freezing but not the extended freeze tolerance demonstrated by painted turtles and box turtles. Garter snakes they tested tolerated 6 hours of -26.1°F temperatures that resulted in body ice contents of 18-36%. The



ing temperatures. In addition, oxygen concentration is higher in cold water than in warm water. Because freshwater turtles like painted turtles, snapping turtles, and stinkpots (Sternotherus odoratus) can obtain enough oxygen across mucous membranes and skin in water at 39.2° F, they can stay on the bottom for long periods of time without coming to the surface for air.

However, although open, cold water has oxygen, mud does not. Turtles buried in the mud experience a buildup of lactic acid, the same stuff that causes muscle aches in humans after exercise. Muscle activity can occur for a short time in the absence of oxygen, but we pay a price. Survival in the mud without oxygen incurs the same price in freshwater turtles. Whereas we stop exercising and breathe in more oxygen to get rid of the muscle ache, turtles on the bottom of a pond move from the mud to open water periodically and swim around to get rid of their muscle aches. That is why the stories of painted turtles and snapby basking on a rock in the sun than using the characteristically mammalian method of temperature control—shivering.

An interesting corollary is that herpetologists do not know much about what reptiles, or amphibians, for that matter, *do* in winter. Because most of us are nearly as inactive as hibernating reptiles, readers who are outdoors in winter could contribute substantially to scientific knowledge. Detailed observations on overwintering sites with numbers of individuals and species would be quite useful.

The ability to tolerate winter conditions, despite their dependence on external sources of heat, has allowed reptiles to occupy the Virginia landscape for thousands of years. However, persecution at dens, destruction of wetlands, and loss of hardwood forest habitat have caused declines in these fascinating animals throughout Virginia's modern history. What useful secrets about cold tolerance will be lost to humankind if we let this trend continue?

limited capacity to withstand freezing suited their adaptation to environmental conditions in rock dens. One has to wonder whether garter snake populations atop some of Virginia's mountains also experience some limited freeze tolerance.

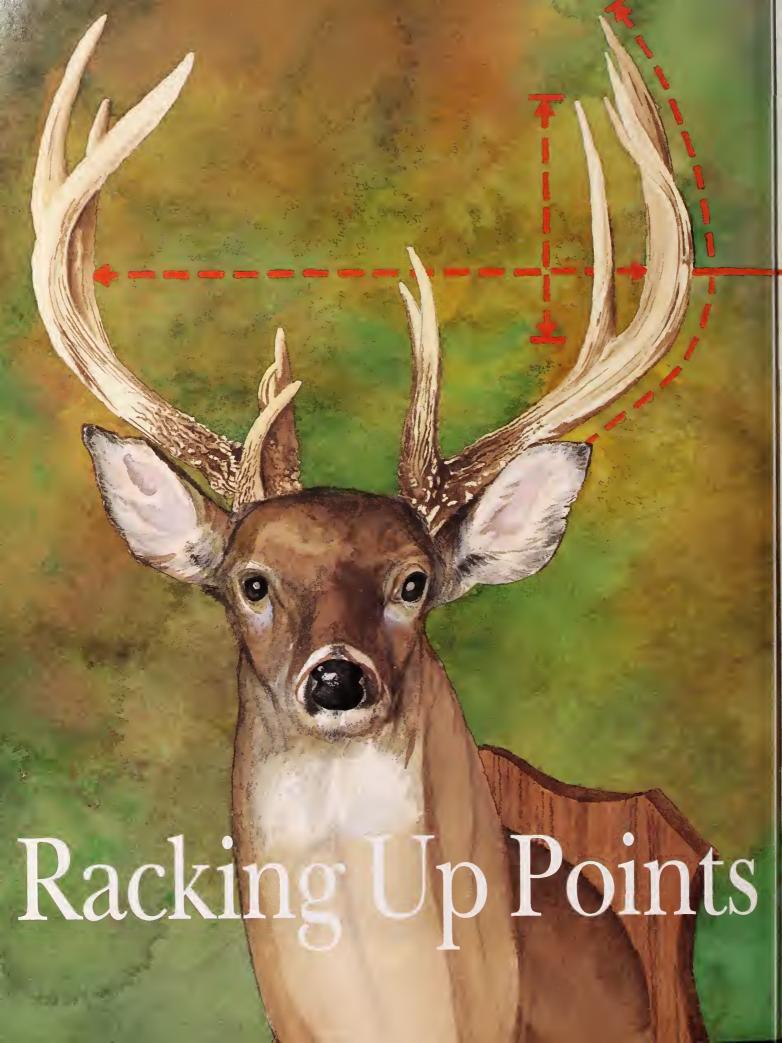
Freeze tolerance can happen only if there is a form of antifreeze in the cells and tissues that conveys protection. So far, glucose (a basic sugar) and glycerol (an alcohol) have been shown to serve as antifreeze in these reptiles. Although freeze tolerance may be more widespread than we know, freeze avoidance is probably the most important mechanism for surviving winters by terrestrial reptiles in Virginia.

Aquatic turtles spend the winter under water, often buried in the mud on the bottom. In some cases this means complete submergence for as long as several months for these normally air-breathing animals. Temperature is not a problem here because water reaches its greatest density at 39.2°F and sinks. Turtles are simply not exposed to freez-



ping turtles swimming under the ice are true.

Humans do not have to shuttle in and out of the sun to keep warm. Bundling up in layers of insulation allow many people to enjoy a wide range of wintertime activities. Herpetologists like me, however, would rather raise our body temperatures Editor's Note: Dr. Mitchell authored the recently published The Reptiles of Virginia, the first comprehensive look at the distribution and identification of reptiles in the state. The book is available for \$42.25 from the Smithsonian Institution Press, Blue Ridge Summit, PA 17294-0900. Call toll-free: 1-800-782-4612. □



What makes a world-class trophy? Find out how a rack sizes up—in the field.

by Gerald Almy

Smith's are fairly uncommon. A typical rack with symmetrical points, usually three to five per side coming off the main beam, is the type the average hunter is most likely to encounter in the woods and fields of Virginia. And once you learn a few rules of thumb and spend some time studying the qualities that make for a high-scoring trophy, it's fairly easy to become an accurate judge of this

hen Jim Smith left his home in Front Royal last November to hunt with his muzzleloader on land he owns near Browntown, he knew the possibility of seeing a big deer was good.

The rut was on and bucks were chasing does, abandoning some of their normal caution. And the location had yielded a l3pointer and a l0-pointer for him in

the past.

But when Smith spotted a buck 40 yards away and dropped it with his blackpowder rifle, even he was shocked at what he saw when he walked up to the fallen quarry. The buck's body was huge, scaling 215 pounds field dressed. But its rack was even more impressive. The whitetail sported 35 points coming off the rack in every shape and direction imaginable. The deer later scored 2597/8 Boone & Crockett points, making it the largest nontypical ever bagged in the state and the largest non-typical whitetail ever bagged with a muzzleloader in the world.

Judging the score of a non-typical trophy such as Smith's in the field while the animal is alive and staring at you would be virtually impossible. Clearly, this buck was outstanding and unique—obviously worth trying for with a carefully placed shot by even the most selective trophy hunter.

type of animal in the field.

Before going into the factors that are judged in scoring a deer's rack, however, it's important to say a few words about trophies. For starters, why does one deer wear a trophy rack, while the next is just a pencil-horned spike?

But non-typical bucks such as

Three factors go into creating a trophy rack on deer: age, nutrition, and genetics. Virginia deer have good genetic quality and the proven ability to grow outstanding racks, as Jim Smith's and other high-scoring bucks have shown repeatedly.

Nutrition can be a factor at times in preventing or allowing a deer in the Old Dominion to grow trophy headgear. In areas with high densities of deer, less food is available and there's more competition for it, so less energy is devoted to growing racks. Deer in these areas tend to have more spindly and narrow racks, with fewer and shorter points.

For the most part, however, the one thing that allows Virginia bucks to grow trophy racks is being able to grow old. Only at 3 ½ years of age do bucks start to show the full potential of their antler growth. At 4 or 5, bucks are even more likely to show peak development in headgear.

The challenge, then, in hunting trophy deer in Virginia really boils down to finding an older deer—one at least 3½ years of age. Chances are if you find such a deer, it will be while hunting a large private area managed for quality deer, or it will be deep within a remote area where few hunters venture.

The second point to make about what qualifies as a trophy deer is



The illustration left was drawn from Hunter Darden's Southampton buck, which scored 188 4/16 in the Virginia Big Game Trophy Contest. Above: The amount of mass or thickness of the antlers adds appreciably to a trophy's score.

that *perspective* is all-important. For a l4-year-old who has perhaps only bagged a doe or a spike, a 2½ year old 8-point with a l3-inch spread would certainly be a trophy. No one would want to diminish the joy and pride of that youngster's accomplishment.

The matter of personal taste also comes into play. Some people favor wide racks, others like tall basket-shaped ones. Some insist on lots of points, while others feel the 8-pointer is most representative of a typical whitetail and a perfectly fine trophy. Some like non-typical racks while others find them odd looking and unattractive.

To keep an objective record of

areas where the deer is lacking in symmetry. Most hunters are concerned predominantly with gross scores, since these describe exactly how much antler there is on a buck. But net scores are important if you decide to enter your whitetail buck in the record book. To do that, you'll need a minimum net score of 170 points to enter the all-time books; 160 or better to enter the latest recording period only.

The odds of taking a deer with that kind of score are one in tens of thousands. But the scoring system itself is still valuable for rating trophies and seeing just how your deer stacks up against others. Any deer taken with a gun that scores in the

widest point on the outside of an animal's rack is what matters to everyone when a big deer is killed. "How wide was it?"

Well, this measurement doesn't even figure into the score. The only "spread" that is included is the *inside* spread. The current world-record whitetail only had an inside spread of 20½ inches, and its net score was an amazing 206½ points.

In general, a buck with an inside spread of 15 inches should be considered an excellent animal. This would typically translate into an outside spread of 17-18 inches. You can judge the width of a deer's rack in the field by comparing how far the rack extends beyond its ear tips



what makes the best whitetail racks, however, a scoring system is required, and the one that is most widely used and accepted is that of the Boone & Crockett Club. This rating system gives you a gross score first from adding up various dimensions on the rack. Then, a net score is obtained by subtracting points for

l30's or higher, or one in the l20's harvested with a bow would be considered a superb trophy by most Virginia hunters.

What are the factors to look for when you see a buck in the field? Spread is the one factor every novice hunter and even many veterans talk about. The distance between the

Twenty inches of main beam is considered trophy caliber, though most bucks that make the record book have two feet or more of length on each main beam. If the main beams extend forward beyond a line drawn vertically with the nose, they are likely 20 inches or more. You can use a deer's ear length to help judge the main beam, too, since a typical whitetail's ear measures 6-7 inches long.

when they are pointed outward. The distance between these ears is usually around 16 inches. If the spread extends beyond the ears an inch or two on each side, chances are you're looking at a very nice buck.

Mass is a factor that seems to become more important the longer you hunt and the more trophy deer you encounter. Mass comes with age and good nutrition. Only deer at least three years old ever show much of it. The five-year-olds are the ones that really show it.

Mass is simply the thickness of the antlers, or their diameter. Measurements for mass are taken between the antler burr and the brow tine and between each set of points,



You can judge the width of a buck's rack in the field by comparing how far the rack extends beyond its ear tips when they are pointed outward. The distance between the ears is usually around 16 inches.

so they can add appreciably to an animal's score.

There aren't many tricks for judging antler mass on a deer. The best way to learn to recognize this is to study lots of deer at taxidermy shops and outdoor shows and big game contests. Racks with good mass simply *look* heavy and impressive.

Main beam length is another factor to consider. Twenty inches is a good beam length and considered trophy caliber by most people. Most bucks that make the record book, though, have two feet or more of length on each main beam. The

biggest typical whitetail ever killed had 30-inch main beams!

Often, bucks with the longest main beams spread outwards and then sweep forward, perhaps even curling back inward. If the main beams extend forward beyond a line drawn vertically with the nose, they are likely 20 inches or more. This can vary, however, depending on how much curve there is in the beam as it goes forward. You can use a deer's ear length to help judge main beam, too, since a typical whitetail's ear measures 6-7 inches long.

The number of points is also important in the final score, because each point is measured for length and each extra set of points off the



main beam gives you an additional circumference measurement for the main beam. A typical mature white-tail usually is an 8-pointer, but a 10-pointer of the same caliber always scores better and a 12-pointer better still. Ten-pointers are fairly common, however, but 12-point typical bucks are quite rare.

The first set of points above the head, often called eyeguards or brow tines, should be at least several inches long, and preferably four or five inches for a superb buck. Other points should measure seven or more inches, and up to 10 or 12 for a really high scoring rack. Also, if you're concerned with net score, be aware that points are detracted from the gross score when the lengths of the tines on the sides are different.

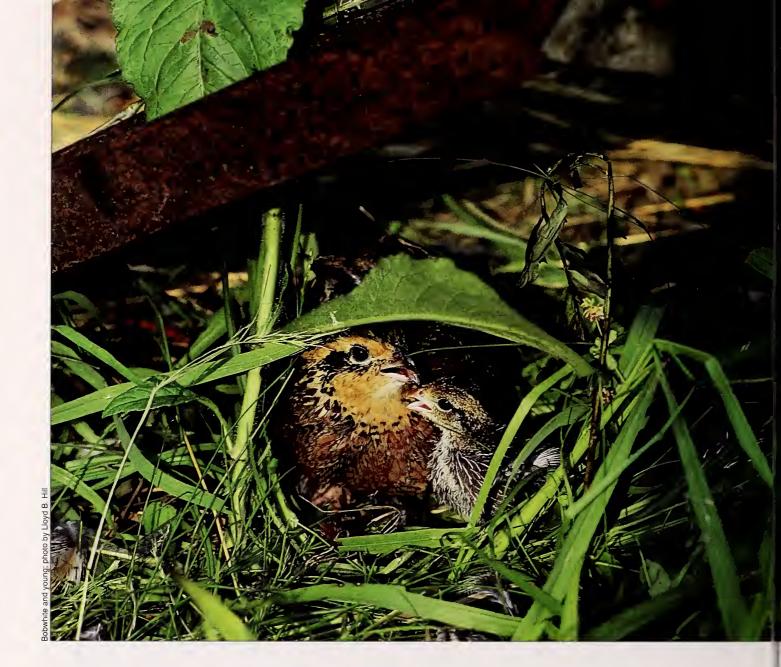
For instance, if the third point on the right was seven inches and the third point on the left was five, you would deduct two points from the final score. Abnormal points coming off the main beam or off of other points are also deducted from the net score of typical whitetail, but are added to the score of non-typicals. Using the length of the deer's ear (6-7 inches) can often help you judge how long the various tines are in the field.

Another factor to keep in mind when viewing deer in the wild is broken points. Whitetails often fight when the rut is approaching and break off points. An otherwise appealing, high-scoring trophy will lose points if one or more of its points are broken off. However, these can be repaired by a taxidermist so they look like the original antlers and most observers would never notice the difference. You couldn't score and enter the animal in a contest, though, if this alteration was made.

Study these ingredients and how important they are in making up the final score of an animal and you'll be much more adept at judging bucks in the wild. Guess the score of mounted bucks, then get out a tape and measure the dimensions of the rack to see how accurate you were. Visit sportsmen's shows and taxidermy shops and look at deer to see how the factors making up the rack's score interrelate and soon you'll find the study of antlers adds a fascinating new dimension to whitetail hunting.

Furthermore, far from being disrespectful, trophy hunting shows even more admiration for the quarry by giving it a greater chance to live a longer, fuller life, and allowing it to reach its prime physical development before trying to harvest it. At that time it is then honored not only on the dinner table, but on the den or office wall as well, a living testament to the richness of the hunt and the quest for something special, not just any deer.

Gerald Almy has been a full-time outdoor writer for over 19 years. He is currently a hunting and fishing editor on the staff of Sports Afield.



# An Unparalleled Pair: Quail and

by Irv Kenyon

B rought from the Far East some years ago, two species of lespedeza were to become as welcome as hot biscuits on a cold morning to a host of admirers in the Southeastern United States, including farmers, soil conservationists and quail hunters.

These lespedezas, common and Korean, the only two annuals among some 140 species of lespedeza, were once grown extensively by farmers throughout the Southeast for summertime pasture and hay. They were sometimes affectionately called "poor man's alfalfa," for their ability to make better growth on poor land than the more finicky alfalfa. The name was also befitting

the economic hard times during the 1930's when these lespedezas were gaining their greatest popularity.

Because they were adaptable to a wide range of soil types and fertility levels, and for their ability to tolerate drought, soil conservationists also touted the arrival of the annual lespedezas. These were well suited for controlling erosion and enriching the soil.



# Lespedeza

Still, probably the loudest and the longest lasting applause for annual lespedeza came from quail hunters. To this group, the value of lespedeza was in the tiny, "Carhartt-durable" seed the plant produced. Regardless of how it was used, the plant usually left behind a generous supply of seed that was frequently a staple in the diet of bobwhite quail. In the view of many long-time quail

hunters, a rise and then fall in the use of "lespedeza" would have a significant impact on the abundance of bobwhites.

Though common and Korean lespedeza are annuals, because of their ability to reseed, both have the quality of being perennial in many instances. Once established, stands will continue to volunteer as long as conditions permit. Today, these are often naturally occurring stands—the result of escape from cultivation years before.

Common lespedeza (Lespedeza striata) was the first to be introduced in the U.S., being used in Georgia in 1846. This particular plant was initially called Japan clover, a reference to its homeland and the clover-like appearance of this, as well as many of the other lespedezas. Kobe (pronounced "Koh-bay") lespedeza, from near a city in Japan, was introduced in South Carolina in 1919. This was to become the most important commercial variety of common, or striate, lespedeza. Korean (Lespedeza stipulacea), also brought to this country in 1919, was first cropped two years later in Arlington, Virginia.

Eventually, the range of the annual lespedezas extended over much of the southeastern quarter of the U.S., with the exception of Florida. Their range is bounded on the north by a line from southern New Jersey to southern Iowa, and on the west from Iowa southward through East Texas to the Gulf Coast.

Interestingly, these same boundaries rather accurately describe the range formerly reported to be that of stabilized populations of the Northern bobwhite, the major subspecies of bobwhite in the U. S. Was this a plant designed to fit the bobwhite's needs? It sometimes appeared so. Still, more likely, the parallel here has been due to environmental influences which have been favorable to both the bird and the plant.

With the addition of Kobe and Korean, by the late 1920's annual lespedeza was having an important effect in the Southeastern states. During the 20 years that followed, the use of these accelerated like a

flushed covey of late-winter bobwhites. Acreage in hay and seed production alone increased from less than one-half million acres in 1929, to seven and a half million acres throughout the region during the 1940's—a 15- fold increase! And these figures do not include what was also a significant increase in lespedeza used for pasture and that grown on idle land to enrich and protect the soil.

Unfortunately, this rise in lespedeza acreage barely leveled off before pitching sharply downward. Agricultural reports show lespedeza in hay and seed production in the Southeast fell by two million acres just during the first half of the 1950's, signaling its rapid decline in popularity with farmers. In Virginia, where lespedeza grown for hay had risen to over a half million acres by 1944, the plant was being cropped on only a few thousand acres by 1974. Since then, lespedeza acreage in Virginia has been too meager to report

Lespedeza simply could not match the volume of forage produced by other hay crops and modern grazing systems. Often, established stands were destroyed to make way for other crops. As commercial fertilizers became affordable to most farmers, its application encouraged competing forbs and grasses, leaving little or no room for lespedeza. "Poor man's alfalfa," was being swept aside by the changing



In the 1930's and 40's, annual lespedezas were grown extensively by farmers throughout the Southeast for summertime pasture and hay. Bobwhites thrived on this bonanza of their preferred food source, which was grown throughout the Commonwealth.

times, as was one of the plant's major benefactors—the bobwhite.

Presumably, the bobwhite was attracted to the earliest introductions of annual lespedeza. Certainly, this attraction became evident as Kobe and Korean came into increased use. Landowners and hunters discovered coveys were often in or near the newly established stands of lespedeza at mealtime. The examination of birds bagged made the reason obvious. Quail crops, packed with this tiny, brown-hulled food item, left no doubt that the all-American bobwhite had a powerful appetite for Oriental food.

The importance of annual lespedeza was also well confirmed by bobwhite food habit studies. Such studies, conducted during the period when the annual lespedezas were being widely used, consistently ranked these among the bobwhite's most important fall and winter foods.

What was the appeal of this newly found food source? Probably more than anything else, it was availability. Important in this regard, of course, was the vast acreage growing lespedeza. Equally important, this acreage was achieved, not by large-scale monocultures so popular today, but rather by a few acres here and there, scattered in patches and small fields across the landscape like the pattern of an open-bore shotgun. Under such conditions, quail could hardly miss finding a "lespedeza patch." Even when hayed or grazed, seed shattered or that remaining attached to the stubble provided gleanings available to quail.

Adding to the quail's attraction to annual lespedeza was its recommended culture. Lespedeza was often planted with small grain or with grasses that provided an "open sod." Thus, not only did the lespedeza produce a tempting meal during fall and winter, but it was grown under conditions that well suited the life-style of bobwhites throughout the year.

To many long-time Southeastern bird hunters, it was no coincidence

that the best quail populations in recent memory occurred when lespedeza was most plentiful. Also, when the popular use of these plants quickly faded, this was regarded by many as a major cause for an observed decline in bobwhite populations.

Certainly, there is no question of the quail's attraction to lespedeza for food and sometimes cover. Less certain, however, is the effect of the



Above and right: There is no question of the bobwhite's attraction to lespedeza for food and sometimes cover. However, the once prevalent use of annual lespedezas were but an addition to a setting which already well accommodated the bobwhite. Created by small fields, both productive and idle, the patchwork pattern of land use of the period provided quail with excellent habitat to raise young and survive.

plant on quail populations.

It should be recognized that from the time of their introduction and throughout the period of their most prevalent use, the annual lespedezas were but an addition to a setting which already well accommodated the bobwhite. Created by small fields, both productive and idle, the patchwork pattern of land use of the period provided the quail with excellent habitat. Suitable cover was plentiful, and for fall and winter food, there were a variety of leftover agriculture grains and weed seeds.

But, for many, the focus was on the lespedezas. In a setting observers may have grown accustomed to, perhaps the presence of the newly added lespedeza made it more visible, therefore more highly regarded. Perhaps the quail also became more visible, or more easily found, in response to this attractive addition to its diet. This alone would seem evidence enough that lespedeza could produce more "birds." Too, quail hunters, including those who conducted food habit studies, often concentrated their efforts where there was lespedeza. Many felt their chances of finding a covey were much better where the birds had to spend more time filling their crops with the small lespedeza seed rather than with larger food items



that might be offered elsewhere. Large foods would permit the birds to take a quick meal and then seek more secure cover.

With such a favorable association between the bobwhite and lespedeza already in mind, it is understandable that those who watched





## Identifying the Annual Lespedezas

B oth of the annual lespedezas, common and Korean, are low-growing forbs, often reaching no more than eight to 10 inches. Their growth may be prostrate, particularly that of common lespedeza, when growing in thin stands. Stems are coarse, or wiry. Both species are most evident during late summer, when they reach their peak of growth. Korean will mature earlier than the common varieties.

Following the first killing frost, patches of annual lespedeza can often be spotted by their darker brown shade compared to the surrounding vegetation. The leaves of each are trifoliate, having three leaflets on each of the leaf stalks.

It is in the leaflets that the greatest difference in the appearance of these two lespedezas are seen. Those of the common varieties are elliptic in shape, their length being approximately twice their width. The leaflets of Korean are broadly oval shaped, similar in shape and size of the leaflets of white clover.

Another major difference are the bracts or stipules at the base of the leaves which are much larger and conspicuous on Korean than common. On both species, seed forms at the axil, or junction of the leaf and the stem. With Korean, however, seeds occur only at the tips of the branches. On the common varieties, the seeds form along the entire stem. The seed will most often be seen in the field-and in the crops of quail—in its brown hull. Hulled, the seed, not much larger than the head of a pin, is solid black if Korean, or is stippled, or marbled, if common lespedeza.

Illustrations by Pels

Red fox fur; photo by Lynda Richardson

as bobwhite numbers began to dwindle several decades ago would consider the disappearance of lespedeza as a significant factor in the decline. Yet, apparently less frequently considered, the decline in lespedeza acreage was being accompanied by a general deterioration and loss of quail habitat. Several accounts, written by some of the bestknown authorities on the subject, indicate quail populations were already declining, or at best holding their own, during the period when the use of annual lespedeza was rapidly rising and reached its peak.

The past use of lespedeza remains in evidence. Individual plants continue to appear mixed with other forbs or with grasses in some long existing pastures and hay fields. Where its competition has been reduced, lespedeza will sometimes reappear where it had grown years before. Idle fields, cutovers, and wild lands in the early stages of plant succession provide the annual lespedezas with scattered locations to reseed each year. Often the pres-

ence of annual lespedeza can indicate that the stage of succession and other conditions are suitable for quail. Interestingly, common lespedeza is also often seen immediately adjacent to the edge of highways, apparently resistant to any highway maintenance.

The future use of annual lespedeza on a grand scale is unlikely. Recently, there has been some promotion of a mixture of selected strains of annual lespedeza and fescue for pasture, but this type of pasture management may not be of much benefit to quail. Annual lespedeza continues to compete with alfalfa, and now warm-season grasses, for the favor of farmers selecting a warm-season forage.

Seeding lespedeza continues to be recommended by quail biologists, and many quail hunters remain faithful to lespedeza when selecting something to plant to help quail. This is often an excellent choice, for the plant's good qualities have not diminished. But the most ambitious efforts today cannot hope to rival the habitat that was once was found throughout the Commonwealth.

Although sometimes more apparent than real, the parallels of the annual lespedezas and the bobwhite have been remarkable. They have shared the same geographical range, and shared a time of plenty. A pronounced decline in bobwhite numbers in many regions two to three decades ago followed a decline in lespedeza acreage...and for similar reasons. Today annual lespedeza is found widely scattered, often isolated, now only a remnant of its past. This, too, can describe present-day bobwhite populations in many areas. For these reasons we must wonder what parallels between annual lespedeza and bobwhite quail might lie ahead, and view with considerable interest the future of these little clovers from the Far East.

Irv Kenyon is a wildlife biologist with the Department who works out of the Ashland office.



Although sometimes more apparent than real, the historical parallels between the rise and fall of the bobwhite populations in Virginia and the farmer's use of lespedezas have been remarkable. However, it is clear that a general deterioration and loss of quail habitat over the years has more seriously taxed our bobwhite populations than the simple loss of their favorite food from our pasturelands.

VIRGINIA WILDLIFE



The Bizzard of '93 hew the author into a rendezvous with a dadwonal fur suction in the meant of Virginia.

by Bob Gooch



he blizzard of the century was blasting central Virginia, but I had to get to Farmville. It was March 13, 1993, and the final fur auction of the year for the Virginia Trappers Association was set for today.

Two desires drove me—a longnursed one to attend a fur auction and observe the trappers and buyers at the bargain table, and the need to market my own modest collection of furs. I had trapped throughout the long 1992-93 season and this would be my final chance to sell my catch at an auction—unless I drove out of state.

Virginia trappers tend to market their furs in three ways. The Virginia Trappers Association holds two auctions a year, one in January to handle the early fur harvest and another in March to close out the season. Another popular method is to work with a local fur buyer, either selling him the unskinned animals or pelts that have skinned, scraped, and cured. The third approach is to ship

furs by mail or some other means to buyers who advertise in the various trapping journals.

Over the years, I had used the latter two methods. As a schoolboy trapper, I had shipped my catch to Sears, Roebuck and Company back when the famous mail-order company was serving rural America. More recently, I had been able to find a local buyer to take the unskinned animals off my hands. For me, trapping has always been more of a hobby than a profession, and skinning my daily catch can be a major effort.

But I had never attended a fur auction. And would I even make this one? A day earlier, with the blizzard settling in with all of its fury, I had serious doubts that it would even be held. I had called Joe Brescia, president of the Virginia Trappers Association and spokesman for the state group. "We're going to try," he assured me. "In fact I'm leaving right now so I will be in Farmville in



The Virginia Trappers Association holds two auctions a year, one in January and another in March. Trappers travel from all parts of the state to sell their well-handled catches, from gray and red foxes (top and right) to beavers (above). Long hours of work and refined craftsmanship is evident in the pelts these trappers have prepared for buyers.

time to get it going." Brescia lives in Chesapeake.

"If anyone can get there, a bunch of trappers should," I offered. But now I wondered.

Farmville is centrally located for trappers scattered across Virginia. I live approximately an hour's drive north of the Southside Virginia city and make the trip often to hunt quail with a friend of long standing. The auction opened at 8 a.m., normally no problem—but today?

It was a few minutes after 5 a.m. when I shifted my truck into 4-wheel drive and eased onto the rural road that provides us access to the highway. The day before I had filled the gasoline tank and stored my collection of furs in the protected body of the truck. But the highway department seemed to be fighting a losing battle keeping the road clear. "If I can just make the highway I should be OK," I thought as I groped through the swirling storm.

A well-lighted convenience store on the highway beckoned, and I pulled in for coffee and breakfast. A steaming cup of coffee in the cup holder and a couple of doughnuts would keep me going as I crept south through the storm.

Abandoned automobiles along the highway warned me of the risks. I stayed in 4-wheel drive for the entire two-hour trip.

Another convenience store greeted me as I reached Farmville in need of directions to the tobacco warehouse where the auction would be held. "Follow me," said a friendly stranger who overhead my question. Obviously another trapper. I bought another cup of coffee and fell in behind him.

Joe Brescia greeted me and introduced me to Pat Pangle of Edinburg, wife of Jerry Lee Pangle, Secretary/Treasurer of the Virginia Trappers Association. "Jerry would trap if he had to pay to do it," she chuckled as she assigned me a number and directed me to a place to display my catch. She checked my name off a computerized membership list of 460 fellow trappers.

The crowd was small, but growing. Trapping is a lonely activity and trappers welcome a chance to visit

with kindred souls. They come as much for the fellowship as for the opportunity to sell their fur. There was Page Moran of Mechanicsville who drove through the storm just for the rendezvous aspects of the auction. "Trapped all winter," he said, "but I'm shipping my furs north for better prices.

"The buyers here have European markets only. The Asian market is better and I want a buyer with access

to that market."

The auction was a bit slow getting started and it gave me a chance to visit with the few trappers already there and to admire their well-handled catches. I could see the product of real craftsmanship in the pelting and stretching, something I obviously had not achieved with my modest catch. Muskrats and otter seemed to be most abundant. Muskrat prices are never particularly high, but those who trap them rely upon volume to produce a good check. I admired Joe Brescia's big catch. "I have just one nutria. The rest are rats," he said.

In that same category was a





friend from nearby Newport News. "I trapped on weekends and holidays," he said. He had drawn lots 6 and 7. One was for a friend and fellow trapper who had recently died of a heart attack. He was selling the trapper's fur for his widow.

Owen Quarles of Covington, a re-

tired forester, handed me his card which identified him as "The Trapper." He does some animal-control trapping, but had a nice catch which included a number of beautiful otter pelts. He also introduced me to his wife Mary. "She trapped in Pennsylvania for 15 years."

From the Valley of Virginia came Galen Dellinger of Mt. Jackson and C. W. Waller of Broadway, both with

good harvests of fur.

Other trappers came from Clintwood, Newport News, Richmond, and many from the Farmville area. I was concerned about the Clintwood trapper getting home, as Interstate 8I was closed west of Wytheville because of the storm. The Woodbridge trapper was employed by the U. S. Fish and Wildlife Service, but looking forward to retiring soon and trapping full time. The depressed fur market in no way seemed to dampen the enthusiasm of the assembled trappers who obviously trapped for the pure joy of it.

John Epler of Pennsylvania was the only buyer initially, and he was buying only beaver and otter pelts. My collection contained a lone beaver pelt. Obviously I couldn't do business with him. He apologized, saying he was simply following or-

ders.

Eventually, a crew representing T. Zander & Sons, Inc. of New Jersey arrived. They were buying everything and I was quickly relieved of my mixed catch containing the lone beaver plus fox, mink, muskrats, mink, opossums, and raccoon. I wasn't overwhelmed by the check I was handed, but knowing the condition of the market, I wasn't surprised. Hopefully, there will be other seasons and a more friendly market.

With check in hand, I was ready to leave, but hesitant to pull myself away from the event. I wandered around studying other collections of fur. There were other beaver, mink, and raccoons, but only two skunks. The bobcats particularly caught my eye. A pair of game wardens arrived to tag the cats and otter. A local trapper drove his snow-covered truck into the warehouse with a good catch of bobcats—unskinned and frozen.

I could have stayed longer, but outside the storm was breaking. The sky clearing. Driving home should be a piece of cake. I headed north—still in 4-wheel drive.

For more information on trapping in

Virginia, write to the Virginia Trappers Association, 2132 Shipyard Road, Chesapeake, VA 23323. □

Bob Gooch is a freelance writer and a frequent contributor to Virginia Wildlife.



## Trophy Fish Program— A New Look in 1995

A sof January 1, 1995, the VDGIF's Trophy Fish Citation Program will take on a new look. Changes in the program include a new name, upgraded awards, the addition of qualifying length measurements

and an application fee.

The Virginia Angler Recognition Program, as it will aptly be renamed, was chosen to reflect the dedicated accomplishments of our state's anglers. This program will administer the Trophy Fish Awards (currently called the Trophy Fish Citations), Expert Angler Awards, and Master Angler Awards. Future plans call for the possible development of a Community Angler Award or a Youth Angler Award.

Starting in January, all trophy fish can be registered by either qualifying weight or length. The current method of qualifying a fish by weight can still be used under the new program. Anglers can continue to take their catch to a store that has scales certified for legal trade and have a clerk weigh it. The clerk must complete the witness information on the new application mailer.

While on-board weight measurements will be disqualified, fish may be qualified afield by length. To do so, the angler must measure the fish in front of a witness and have the witness complete the witness information on the application mailer. If a witness isn't available, the angler can photograph the fish next to a measuring rule. Again, length justification must be supported by a witness verification or a photograph

Trophy Fish Award Certificates will reflect length or weight or both. A check or money order in the amount of \$4 per application must be enclosed in a new mailer in order to process the application. The certificates will be of upgraded quality

from the current certificate and will display the species of fish caught.

The same species artwork will also highlight patches for the Expert Angler Awards. Anglers who register 10 trophy fish of the same species will now receive a frameable certificate as well as a full-color, species-specific patch that denotes them as a lifetime Expert Angler for that species. There are 22 species currently designated in the program.

A frameable certificate and a series of four patches highlight recog-

nitions for the Master Angler. To qualify for a Master Angler Award, an angler must register 5 trophy fish of different species. To obtain the series of four awards, each group of 5 trophy fish must be completely different from the others. Master Angler Awards have also become lifetime designations.

Processing time for all awards remains at 6 to 8 weeks. For additional information, you can phone the Virginia Angler Recognition Program office at 804/367-8916.  $\square$ 

### Virginia's Trophy Fish Size

A fish in the Virginia Angler Recognition Program is considered a trophy if it meets or exceeds the following weights or lengths:

| Species          | Length | Weight         |
|------------------|--------|----------------|
| Largemouth Bass  | 22"    | 8 lbs.         |
| Gar              | 40''   | 10 lbs.        |
| Smallmouth Bass  | 20"    | 5 lbs.         |
| Muskellunge      | 40"    | 15 lbs.        |
| Striped Bass     | 37"    | 20 lbs.        |
| Northern Pike    | 30"    | 6 lbs.         |
| Rock Bass        | 12"    | 1 lb.          |
| Yellow Perch     | 12"    | 1 lb., 4 ozs.  |
| White Bass       | 18"    | 2 lbs., 8 ozs. |
| White Perch      | 13"    | 1 lb., 4 ozs.  |
| Bowfin (Grindle) | 30"    | 10 lbs.        |
| Sunfish          | 11"    | 1 lb.          |
| Flathead Catfish | 40"    | 25 lbs.        |
| Brook Trout      | 16"    | 2 lbs.         |
| Channel Catfish  | 30"    | 12 lbs.        |
| Brown Trout      | 25"    | 5 lbs.         |
| Blue Catfish     | 34"    | 20 lbs.        |
| Rainbow Trout    | 22"    | 4 lbs.         |
| Carp             | 34"    | 20 lbs.        |
| Walleye          | 25"    | 5 lbs.         |
| Chain Pickerel   | 24"    | 4 lbs.         |
| Crappie          | 15"    | 2 lbs.         |

#### Measuring the Length of a Fish for Certification

Fish should be measured to the nearest ¼ inch. Lay the fish on a flat surface. Using a measuring rule measure from the tip of the snout to the end of the tail with mouth closed and tail lobes pressed together.

by Nancy Hugo

## Running Cedar

unning cedar suffers for its Neauty. Because its trailing stems punctuated with tufts of evergreen foliage look like ready-made Christmas garlands, this woodland groundcover is hard for decorators to resist.

"My father used to pull it out and put it in the house for Christmas," says Midlothian resident Linda Holt Armstrong. "He loved the way it looked. I told him we had to stop doing that because the plant was running out of habitat with all the houses being built and all that, and he just looked at me and said, 'If they're looking for it, I can show'em 10 acres."

How to argue with Mr. Holt? Here's the way a Virginia Native Plant Society flyer does it: "Do Not Use This Plant For Christmas Decorations. Ground pine is often used at Christmas for wreaths and roping. Unfortunately, all plant material offered for sale has been collected from wild populations because it is not currently being propagated and grown commercially. In some areas over-collection has led to serious depletion of wild stands."

There's the rub. While your woods may have large colonies

of running cedar (or other species of Lycopodium often referred to as ground pine) and you know you'd never use enough to seriously deplete your resource, someone collecting running cedar from public land or collecting it to sell may not be so scrupulous. There are also many areas in which running cedar is not abundant, and the plant is slow to reproduce. Using running cedar for decorations, no matter how much of it you have, suggests to others that collecting it is OK.

Another reason to enjoy running cedar outside rather than in is that it dries out quickly and is highly flammable. Lycopodium spores, which are borne on yellowish cones that look like slender candles or clubs rising above the whorls of foliage, are so flammable that they were used to create the flash in early flash photography, and as late as the 50's they were used in fireworks. I'm also aware of a chemistry experiment designed to show Lycopodium's flammable properties. On the back of a Christmas napkin I still have, a chemistry teacher once drew for me the outline of an experiment in which sprigs of Lycopodium are put inside a box (or is it a can?) along with a lit candle. I can't remember



Running cedar is best left to adorn our forest floors and not our mantlepieces at Christmastime; photo by Hal Horwitz.

whether the flame leaps to the Lycopodium or if there's an explosion—maybe both, but the result shows how easily Lycopodium's dust-like spores ignite, and I think of it every time I see running cedar used to decorate a fireplace mantle.

There are about a dozen species of Lycopodium in Virginia, and their habitats range from dry woods and rock barrens to swamps. Running cedar (Lycopodium flabelliforme), also known as running pine, creeping Jenny, or crowfoot, is one of our most common species. Standing cedar (Lycopodium obscurum) is also

relatively common. Also called princess pine or bunch evergreen, L. obscurum stands erect like a miniature (6-8") coniferous tree. Like running cedar, it suffers from over-collection as a Christmas green.

Because of their clublike cones, Lycopodiums are commonly called club mosses, but they have more in common with ferns than mosses. They are ancient plants with forebears that once stood 100 feet tall in swamps that preceded the dinosaurs. Their form of reproduction is more primitive than that of flowering plants; instead of seeds, they produce spores, and the gametophytes that germinate from these

spores are so seldom seen that a botanist who spots one considers himself lucky. Lycopodiums also spread by runners, but I have been singularly unsuccessful in transplanting rooted runners from one part of my woods to another.

Lesson: Leave this beautiful native groundcover where you find it. On the dry, poor soils that underlie my Buckingham county woods, a patch of running cedar is like a pocket of richness. The scaly leaves and stems of running cedar catch

and hold leaf litter in a way that builds up soft, moldy areas that stand in stark contrast to bare, eroded areas nearby. If I were to make my bed in the forest with only the softness of my "mattress" as a consideration, I'd bed down on the running cedar.

"Hagbed" is, in fact, one of running cedar's other common names. Because it has such an uncomplimentary ring to it, maybe spreading that name around could help with running cedar's conservation problems, as in "Why pick that? That's just some ol' hagbed."  $\square$ 



## Metric Management

et's face it, the metric system is coming. All over the world, the metric system is used on road maps in place of miles, and measuring speed, size of bolts, nuts, weight, and countless other things. We are still using the old British system of feet, inches and pounds, but that must be changed, especially in relation to manufacturer's items destined for export. As boaters we should be interested in how the changes will affect us.

The territorial waters of the United States including the Great Lakes, Puerto Rico, U. S. Virgin Islands, northern Marian Islands and other U. S. possessions are charted by the National Oceanic and Atmospheric Administration (NOAA) Coast and Geodetic Survey (C&GS). That responsibility requires C&GS to maintain about 1,000 nautical charts.

Because the metric system is used by almost every maritime nation on their nautical charts, the United States must use that system to be in step with the rest of the world. In order to promote the conversion, the Omnibus Trade and Competitiveness Act of 1968 and the Metric Conversion Act of 1975 established the metric system of weights and measures as the preferred system for the USA. Those Acts require all federal agencies to expedite conversion to the metric system.

C&GS is replacing units of measurement on its nautical charts with metric equivalents. Charts of the head of navigable water will be con-

verted first. Subsequent charts will be converted progressively toward coastal waters. Coastal waters in our part of the world are the high seas, Chesapeake Bay, and parts of some rivers. Virginia rivers are coastal only if they are more than two miles wide at the mouth. They continue to be coastal, as you go upstream, until they are less than two miles wide.

Additional coastal waters are the entrance to Hampton Roads, the York River, Mobjack Bay, entrance to

Get used to it: metric is coming to the boating world! Photo by Soc Clay.

the Piankatank River, Rappahannock River, Virginia parts of the Pocomoke and Tangier Sounds and the places where the uncharted inlets of the Atlantic Ocean are reduced to two nautical miles in width.

Chart features affected are depths, heights, distance, depth curve intervals, elevation and land-contour intervals, bridge, cable and pipeline clearances, tidal information and measurement information contained in chart notes. All information will be expressed using the metric system.

Nautical miles will remain unaffected. The charts will still have a distance scale in yards as well as one in nautical miles

and one in meters.

Most boaters will get used to converting to the metric system. Initially, there are a few simple methods to readily convert metric measurement to the familiar numbers which have been used so long.

Measurements can be converted by using approximate figures. One meter is a little more than 39 inches. It is about three inches more than a yard, which is a common unit of measurement. The most important metric measurements to be remembered are the vertical height of your vessel and its draft.

The impact of metric measurement on boating is relatively insignificant. For the last 10 years, manufacturers have installed a switch on depth-sounders to permit the display of waters depths in either feet or meters. Most often we will

use approximate conversion factors and quick mental calculations to cope with the changes aheads.  $\square$ 

DECEMBER 1994 29

Recipes

**By Joan Cone** 

## Enjoy New Meals With Ground Venison

B ecause ground venison contains one third less fat and cholesterol and one third more protein than the same amount of beef, it's healthier for all of us.

Rather than sacrifice a prime cut of venison, keep a large bowl for scraps and thinner pieces of meat when you are butchering or trimming. Then you simply grind it. Do not add any beef fat to ground meat you intend to freeze. Fat does not hold up well when frozen. Eventually it becomes rancid, and your ground meat is ruined.

Let's turn, now, to good venison dishes requiring no added fat to your ground meat.

#### Recipes

Hearty Venison Bake Venison-Rotini Soup Taco Deep Dish Microwave Venison Dinner

#### **Hearty Venison Bake**

2 cups mashed potato dry mix ½ cup margarine or butter, melted 1 pound ground venison ½ cup chopped onion 1 tablespoon Worcestershire sauce ½ teaspoon salt 1/8 teaspoon pepper 2 eggs or 1/2 cup egg substitute 1 cup small curd creamed cottage cheese 2 tomatoes, sliced 1 cup shredded Cheddar cheese

Preheat oven to 350°. Mix potatoes and margarine; reserve ½ cup. Spread remaining potato mixture in ungreased square baking dish, 8 x 8 x 2-inches. Cook and stir ground venison and onion until venison is brown; drain. Stir in Worcestershire sauce, salt and pepper. Spoon onto potato mixture in dish. Mix eggs and cottage cheese and pour over venison mixture. Top with tomato slices. Sprinkle with Cheddar cheese;

spread with reserved potato mixture. Bake uncovered until set, about 20 minutes. Makes 4 to 6 servings.

#### Venison-Rotini Soup

1 pound ground venison
1½ cups uncooked rotini
1 envelope chili seasoning mix
4 cups water
1 can (16 ounces) whole tomatoes, broken up
1 can (8 ounces) tomato sauce
1 package (10 ounces) frozen mixed vegetables
1 tablespoon instant minced onion
1 tablespoon sugar

1 cup dairy sour cream

1 tablespoon dried chives

Brown venison in a Dutch oven, stirring to crumble; drain. Add rotini, seasoning mix, water, tomatoes, tomato sauce, vegetables, onion and sugar. Cover and simmer 15 minutes or until rotini is tender. Combine sour cream and chives and serve with soup as garnish. Makes 6 to 8 servings.

#### Taco Deep Dish

1 pound ground venison
1 can (12 ounces) whole kernel corn
with red and green sweet
peppers (with liquid)
1 envelope (1½ ounces) taco
seasoning mix
½ cup water
1½ cups biscuit baking mix
½ cup yellow cornmeal
¼ cup plus 2 tablespoons water
¼ cup margarine or butter, softened
1 can (3 ounces) French fried onions,
crushed
1 cup shredded Cheddar cheese

Cook and stir ground venison in 10-inch skillet until brown; drain. Stir in corn, seasoning mix and ½ cup water. Heat to boiling; reduce heat. Simmer uncovered, stirring occasionally, until mixture is thick, 8 to 10 minutes.

Preheat oven to 400°. Grease square pan, 9 x 9 x 2-inches. Mix baking mix, cornmeal, ½ cup plus 2 tablespoons water, the margarine and onions until soft dough forms; beat vigorously 30 seconds. Lightly press dough on bottom and 1 inch up sides of pan with floured fingers. Top with beef mixture; sprinkle with cheese. Bake until crust is golden brown, about 20 minutes. Let stand 5 minutes before cutting. Makes 9 servings.

#### Microwave Venison Dinner

¾ cup yellow onion, chopped
1 pound ground venison
1 cup elbow macaroni, uncooked
1 can (15 ounces) stewed tomatoes, chopped with liquid
1 can (8 ounces) tomato sauce
1 cup frozen whole kernel corn, thawed
1 teaspoon packed brown sugar
1 teaspoon chili powder
¼ teaspoon cumin
1 cup water
Salt and pepper to taste
1 tablespoon balsamic vinegar
¼ cup Cheddar cheese, shredded

Place onions in a plastic colander; set inside a 3-quart dish and cover. Cook on HIGH power for 2 to 3 minutes or until soft. Add the ground meat. Cook on HIGH power 21/2 to 3 minutes or until meat is no longer pink, stirring once. Discard liquid that has collected in bottom of dish. Place the meat/onion mixture in the bottom container. Add the macaroni, tomatoes with liquid, tomato sauce, corn, brown sugar, chili powder, cumin, water, salt and pepper to the meat mixture. Mix well and cover. Cook on HIGH power 17 to 20 minutes, stirring after half the cooking time. Stir in the balsamic vinegar. Garnish with cheese. Makes 4 to 6 servings.



## A Photographer's Holiday Wish List

.K. Where's your list?" Mom glared at me with that knowing look of hers.

"Awwww, Mom. I don't know. I don't want anything...hmmmm. What kind of price range are we talking?"

"Well, you know the rules. No

list, no presents."

It's the same thing every year. The holiday season rolls around and with it comes the arduous task of figuring out what gifts to buy. But my mom has it all figured out. On December 1 she sticks out her hand and points to her palm. It's the annual sign for "Where's your Christmas wish list?"

Lists are a great idea. This season I'd suggest getting one from the photographer on your gift buying list. Suggest they jot down their favorite film, camera, books, photo store or catalog and any other acces-

sories they might need.

Photographers can always use film. As there are many, many varieties of film on the market, a list can help you avoid purchasing the wrong type. Just make sure your photographer writes down the brand name, ASA/ISO, and whether the film is slides or prints. Before purchasing any film, check the expiration date on the side of each box. The farther away from the date, the better. The reason for this is that it gives your photographer plenty of time to shoot your gift. In addition, try to keep the film cool and dry while it's in your care. Never leave film in a car or anywhere else where it might heat up. Professional films are especially sensitive to heat and need to be refrigerated until use. Ask if the film you are buying is considered professional. A sure sign is whether the sales clerk pulls the film out of the large in-store cooler.

Another suggestion might be to give a gift certificate. Many local camera shops, frame shops and mail-order catalogs will issue gift certificates towards film, processing, framing or any other purchases. Gift certificates can usually be purchased in varying dollar values, happily fitting any budget.

In the past, I've mentioned leader pullers, archival slide pages, loupes and light tables. All of these are still

great gifts.

But consider, what does a photographer do with all those pictures they've taken during the year? Ask your photographer if they would care for a photo album. Frames are another popular gift for anyone on your list. Make your gift extra special by including a meaningful photograph beneath the glass.

Books are my favorite gifts to give and receive. This year, a new book to look for is Art Wolfe's, *Migratious*, by Beyond Words Publishing (\$60). This beautiful book, in true Art Wolfe style, displays incredible photographs of migrating creatures from across the globe. The text, by Barbara Sleeper, provides a lovely accompaniment to Art's images. This book is a must for one's growing collection of important wildlife photography books.

A series of books to look for are the *Wildlife Photographer of the Year* portfolios. These books showcase winners of the BBC Wildlife Photographer of the Year competitions

which have been in existence for 11 years though this is only the third year they've produced a book. To give you an idea of the scope of this prestigious competition, this year had over 12,000 slides attracting entries from 50 countries. To order your BBC book, you can either go through a large bookstore chain, or contact Natural History Book Service, P.O. Box 24, NHBS, 2-3 Wills Road, Totnes, Devon TQ9 5XN, United Kingdom; telephone 011-44-0803-865913 in England. I believe the books are around \$20-25 U.S. dollars, plus shipping if ordering from England.

If you are having trouble thinking up something for the shutterbug, have them come up with suggestions for gifts this holiday season. You never know. You might start a family tradition like the one in my family. "Where's your list?"

Happy Holidays!



DECEMBER 1994

## VIRGINIA WILDLIFE GIFT CATALOG

### VIRGINIA WILDLIFE POSTERS











Just \$8 each. Specify wood duck, barred owl, white-tailed deer (all 19 ½" X 27 ½"), freshwater game fish (21" X 36"), saltwater fish (21 3/4" X 34"), or endangered species

Irginia W<mark>ildlife Calendar</mark>

(18" X 24"). Make check payable to Treasurer of Virginia and send to: Virginia Wildlife Poster Offer, VDGIF, P.O. Box 11104, Richmond, VA 23230-1104.

#### PRINTS



"Winter Comfort" by Bob Henley, a signed and numbered limited edition (950) print 13" X 19 ½". \$45 each.

Make check payable to Treasurer of Virginia and send to "Winter Comfort" VDGIF, P.O. Box 11104, Richmond, VA 23230-1104.



1994 Virginia Waterfowl Stamp Print by Francis Sweet. Lesser Scaup swim below the 200-yearold Mount Vernon overlooking the Potomac River. For details and pricing information, contact your favorite art gallery or Sport'en Art in Sullivan, IL toll-free at 1-800-382-5723.

Overall size: 12" X 14".



\$6.50 each. Featuring frameable world-class photography and useful information about the outdoors, hunting and fishing. This calendar runs from September 1994 through August 1995. Make checks payable to Treasurer of Virginia and send to: Calendar, VDGIF, P.O. Box 11104, Richmond, VA 23230-1104.

#### BOOKS



The Reptiles of Virginia
by Joseph C. Mitchell. \$40 plus \$2.25 each
postage and handling. This is the first complete catalogue of Virginia's snakes, lizards,
and turtles. Featuring 63 full-color illustrations, distribution maps and easy-to-use
identification keys in 384 pages. Order
from: Smithsonian Institution Press, Blue
Ridge Summit, PA 17294-0900. Call tollfree 1-800-782-4612.



Freshwater Fishes of Virginia by Robert E. Jenkins and Noel M. Burkhead. \$85. This authority on the Virginia's fishes takes an in-depth look at 210 fish species. Over 1,000 pages with 40 color plates. Order from: Virginia Chapter, American Fisheries Society, c/o VDGIF, P.O. Box 996, Verona, VA 24482. Make checks payable to VA Chapter, AFS.



Virginia's Endangered Species
by Karen Terwilliger. \$32.95 softcover,
\$59.95 hardcover plus 4.5% sales tax and
\$3.50 each shipping and handling. This 675page book with 229 color plates, 331 black
and white figures, two appendices and three
indices is the definitive guide on
Virginia's endangered and threatened fish
and wildlife. Order from: McDonald and
Woodward Publishing Company, P.O. Box
10308, Blacksburg, VA 24062-0308.
Phone: 703/951-9465.

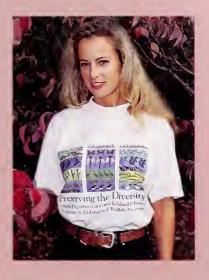


Virginia Wildlife 1993. \$15.00. In one handsomely bound volume, you can have all twelve issues of Virginia Wildlife at your fingertips. A ready source of information and reference material for the young and old. Order from:

Virginia Wildlife, P.O. Box 11104, Richmond, VA 23230-1104. Make checks payable to: Treasurer of Virginia.

#### T-SHIRTS

\$12 plus \$2.50 each shipping. Wear your support of Virginia's Endangered Species Program by purchasing a colorful tshirt in M, L, XL. Send your order to: T-Shirt Offer, VDGIF, Attn: Toni Harrison, P.O. Box 11104, Richmond, VA 23230-1104.



# Virginia Water Resource Education

#### ANGLER HOW-TO KITS

Beginning Angler or Bass'n Basics. \$15 each. The perfect gift for the promising young angler, Beginning Angler includes a 30 minute video, an 18-page color identification

guide of freshwater game fish, a full-color poster of Virginia's sport fish, a pocket field guide to fishing lakes and reservoirs, a coloring book, a bumper sticker, and more. *Bass'n Basics* targets the intermediate angler seeking to learn more about the challenges of fishing for largemouth bass. Includes a 2-hour video, tips and techniques guide, full-color freshwater sportfish poster, boating information, and more. Order either kit from VDGIF, Aquatic Education Coordinator, P.O. Box 11104, Richmond, VA 23230-1104. Make checks payable to Treasurer of Virginia.

#### LICENSE PLATES



#### ALL NEW DESIGN!





Now you can proudly display your support of the Virginia Department of Game and Inland Fisheries with our **new** white-tailed deer license plate! Available from the Department of Motor Vehicles (see gray card in this magazine), you can now order the white-tailed deer, largemouth bass or mallard Wildlife Conservationist license plate. Sales proceeds will benefit VDGIF's efforts to conserve and manage fish and wildlife populations today—and tomorrow.

Preserving in bronze what we're losing in the wild

An Endangered Species Series by Turner Sculpture

ontinuing to capture the essence of Virginia's endangered species in bronze, David Turner of Turner Sculpture has created the third in his Endangered Species Series to raise funds for Virginia's Nongame and Endangered Species Program.

Turning to the wind-swept beaches and mudflats of his native Eastern Shore, David has chosen to capture the spirit of the delicate, yet spritely piping plover in bronze. Perfectly camouflaged among the speckled beaches, the piping plover can disappear from view in an instant, blending into the landscape with the help of its sand-colored body, black collar, and a black nick of a crown between the eyes.

This federally endangered shorebird is teetering on the brink of extinction, and every year we hold our breath hoping to see signs of recovery. One-quarter of the East Coast piping plover population nests on the beaches of Virginia's barrier islands, struggling to increase its numbers amid the hardships of habitat loss, nest destruction, and predators hungry for a meal of eggs or tiny young.

Like the Northern flying squirrel (featured above) and the sold-out Bewick's wren sculpture, a limited edition of 200 piping plovers will be cast and sold solely to benefit Virginia's Nongame and Endangered Species Program, the program responsible for the management and protection of all the Commonwealth's rare

and endangered wildlife. The money raised from the sale of the three sculptures will provide the program with over 1/10th of its present operating budget.

Each sculpture has a purchase price of \$325. Turner Sculpture will receive \$175 to cover their production costs, while the remaining \$150 will be sent to the Virginia Department of Game and Inland Fisheries as your contribution to Virginia's Nongame and Endangered Species Fund. A tax advisor should be consulted regarding the personal tax deductibility of this contribution. Each piece sold will include a certificate of origin and a letter confirming your contribution to the

future of Virginia's wildlife.

You may order either the piping plover or the Northern flying squirrel by sending a \$325 check for each signed and numbered sculpture to: Turner Sculpture, Box 128, Onley, VA 23418. For credit card orders, call: 804/787-2818.

Orders received by December 15 will arrive in time for Christmas,

Photo of piping plover approximates actual size.





TURNER
SCULPTURE

Nongame and Endangered
WILDLIFE - PROGRAM
WEGNA DEPARTMENT OF GAME AND IN AND INSTERIOR

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Need some help this holiday season? Don't want to blow your budget?

